3M™ Crimplok™+ Connector

8700-UPC & APC SM SC 250/900 µm
6700-50 SC 50 µm MM 250/900 µm
6700-50/LOMMF SC 50 µm LOMMF 250/900 µm
6700-62.5 SC 62.5 µm MM 250/900 µm

Instructions

November 2013
78-0013-1746-6-E

3M

Safety Precautions

Protective Eyewear

⚠CAUTION

To reduce the risk associated with eye injury:
- Safety glasses should be worn when handling chemicals and cleaving the optical fiber.

Chemical Precautions

⚠WARNING

To reduce the risk associated with fire:
- Storage, use and disposal of isopropyl alcohol should be per your company health, safety and environmental instructions. Refer to material safety data sheet for health hazards, safe handling, proper use and control measures.

Bare Fiber Handling

⚠CAUTION

To reduce the risk associated with handling sharp glass fibers:
- Cleaved glass fibers are sharp and can pierce the skin. Use tweezers when handling shards and dispose of them properly per your company health and safety instructions.

Fiber/Cable Handling

NOTICE

To reduce the risk associated with fiber damage:
- Optical fiber can be damaged by excessive tensile, compressive and bending forces. Consult the manufactures' specifications for proper handling instructions.

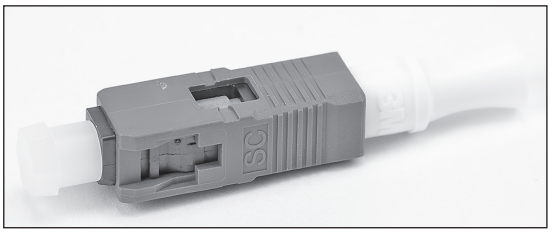
Laser Safety

⚠CAUTION

To reduce the risk associated with eye damage from exposure to laser light:
- Take the proper precautions when working with optical fiber because invisible laser light may be present. The principal laser hazard when working with fiber optics is injury to the eye. Never look directly into the fiber or connector using the naked eye or a microscope.

1.0 Overview

1.1 3M™ Crimplok™+ Connectors 8700-UPC & APC terminate 250 µm and 900 µm singlemode fibers, and the Crimplok+ 6700 series connectors terminate 250 µm and 900 µm multimode fibers for excellent optical performance.



3M™ Crimplok™+ Connector

1.2 Required tools, available in the 3M Crimplok+ SC/UPC Kit 8765-UPC for the 8700-UPC and 6700 connectors and the 3M Crimplok+ SC/APC Kit 8765-SC/APC for the 8700-APC connector.

A. Cleaver

B. 3M Protrusion Setting Tool 8765-PS/UPC for 8700-UPC and 6700, 8765-PS/APC for 8700-APC

C. 3M Nano-finisher 8765-NF/UPC for 8700-UPC and 6700, 8765-NF/APC for 8700-APC

D. 3M Green Lapping Film for APC
3M White Lapping Film for UPC
(included with connectors and also in kit)

E. Cleaning swabs 8765-CS

F. Lint-free wipes 8765-LFW

G. Fiber stripper

H. Fiber snips

I. Tweezers

J. Water spray bottle, empty 8765-WB

K. Alcohol bottle, empty VOL-0560R (optional)

L. Cleaning brush

M. Eye loupe, 10X

N. Case

O. Work surface plate

P. Shard container

Q. Instruction manual (not shown)

Note: The protrusion setting tool and nano-finisher cannot be used with any connectors or processes other than the 3M Crimplok + Connectors.

1.3 Additional materials needed:

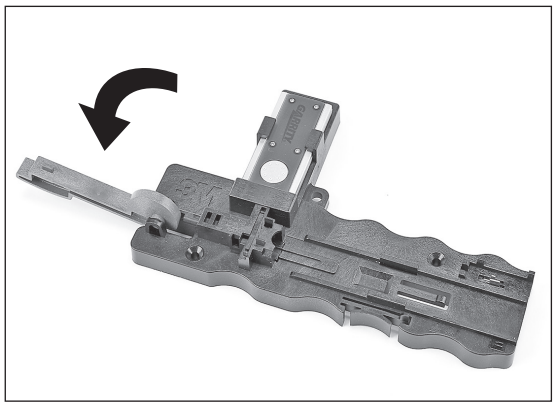
- De-ionized or distilled water for nano-finishing at above-freezing temperatures
- 25% to 35% methanol by volume and 75% to 65% de-ionized or distilled water solution by volume for nano-finishing at below-freezing temperatures. DO NOT use ethanol or isopropyl alcohol for nano-finishing.
- 99% pure isopropyl alcohol (for cleaning only) or a fiber optic connector cleaning solution approved by your company.

Note: Carefully follow safety, health and environmental information given on product labels or the Material Safety Data Sheets for isopropyl alcohol, fiber optic cleaning fluid, and/or methanol/water solution.

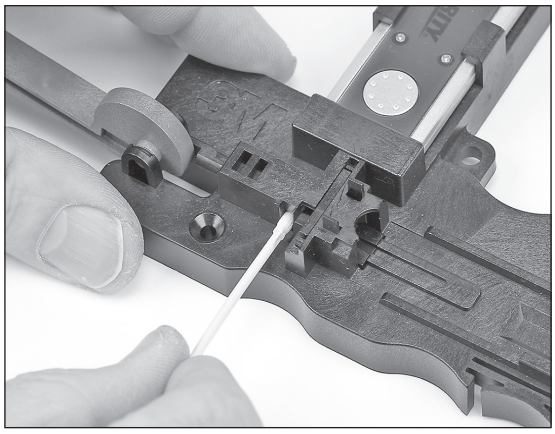
1.4 Optional accessory:
3M™ 200X View Scope 6365-VS. DO NOT use when connectors are illuminated by a laser source.

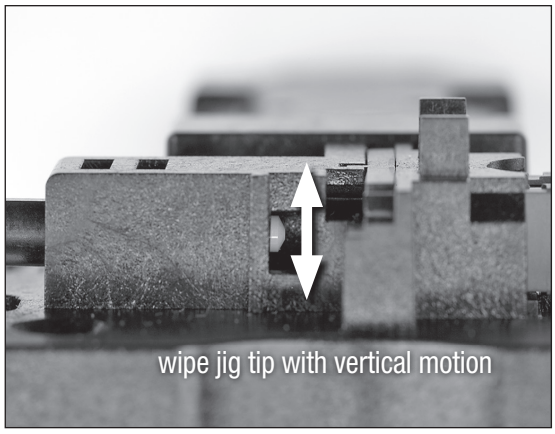
2.0 Connector and Protrusion Setting Tool Preparation

2.1 On the 3M™ Protrusion Setting Tool, move the actuator lever to the unactivated position as shown.



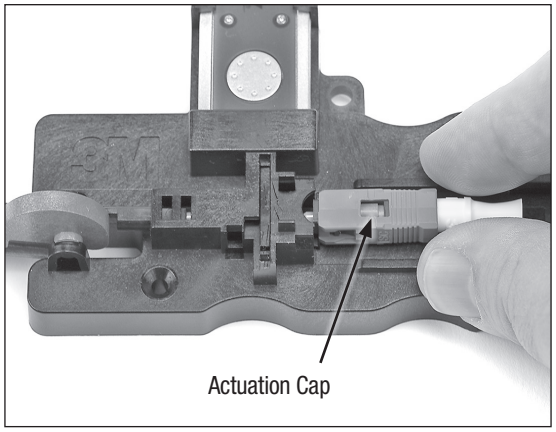
2.2 Clean the tip of the protrusion setting jig using a lint-free cleaning swab with a drop of alcohol or cleaning fluid. Reach through the window with the swab and move the swap tip vertically to clean the jig tip.

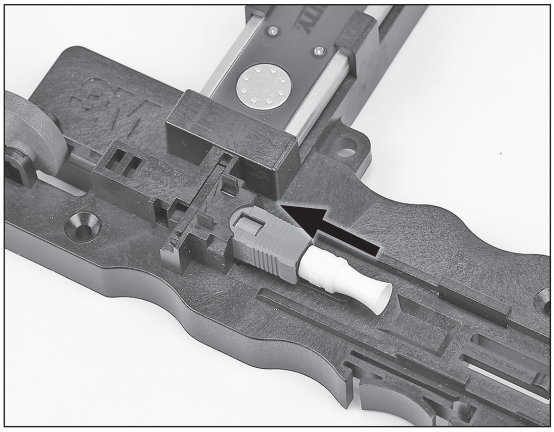




2.3 Remove the 3M™ Crimplok™+ Connector from the bag and remove the dust cap from the ferrule. Remove the lapping film disc from the bag and set it aside for later.

2.4 Insert the connector into the SC port with the actuation cap facing upward. Ensure the connector is fully seated in the port.

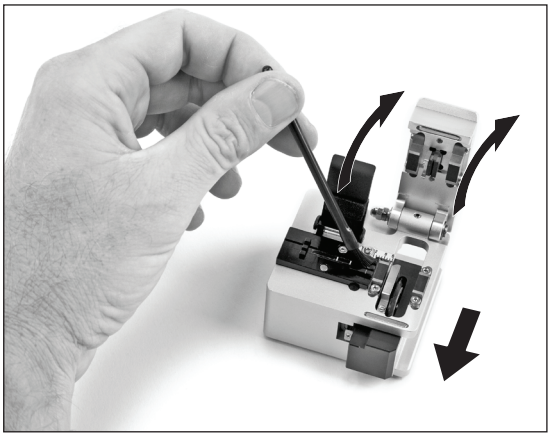




3.0 Fiber Stripping & Cleaving

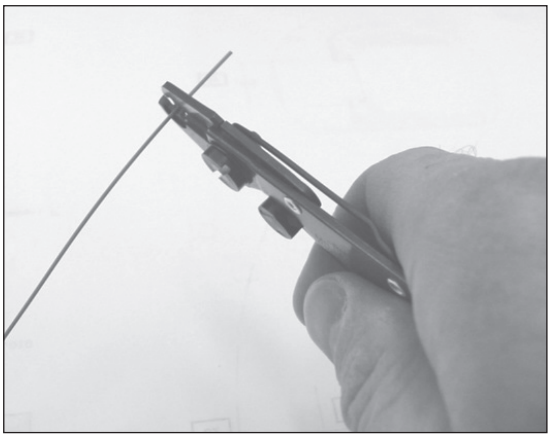
3.1 Open both covers on the cleaver. Move the blade carriage to the front. Once per day, or whenever the cleaver gets dirty, clean the fiber groove, rubber pads and blade with the brush.

Note: Cleaver can be silver-colored or dark grey-colored.

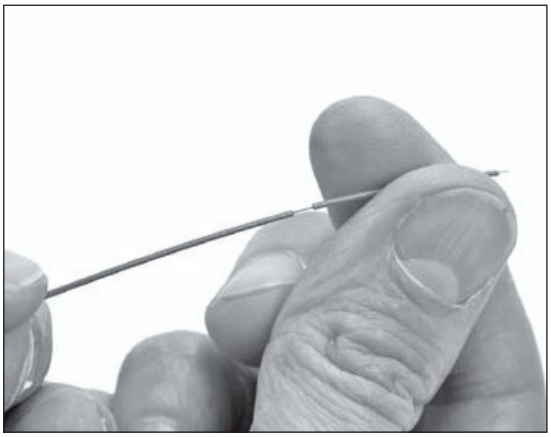


3.2 If working with cable, strip at least 230 mm (9 in.) of cable jacket away to expose just 900 or 250 µm coating. Holding the fiber stripper perpendicular to the fiber, strip enough 900 or 250 µm coating (minimum of 40 mm) to allow the fiber to extend well beyond the second pad on the cleaver as shown in Section 3.7.

Note: Do not grip the fiber stripper with full strength, because it can damage the tool and weaken the fiber.

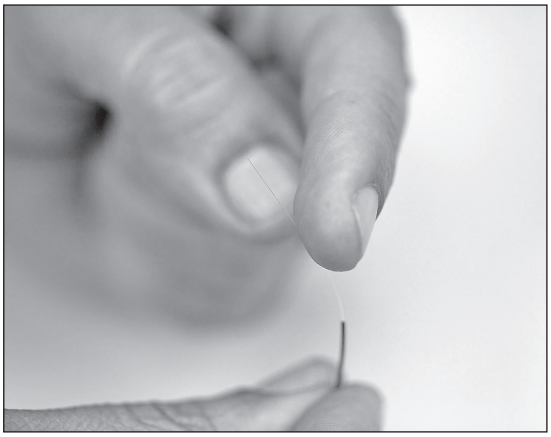


3.3 For 900 µm, determine if the fiber is tight or semi-tight buffer. If the 900 µm slides easily from the fiber, it is semi-tight buffer fiber. If not, it is tight buffer. Break-out kits for 250 µm are semi-tight. Make note of tight or semi-tight for step 3.11.



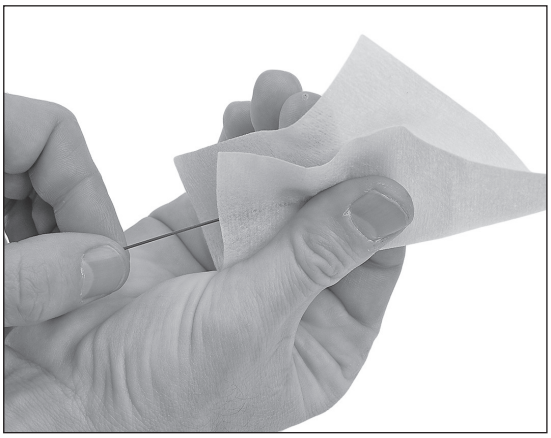
3.4 For semi-tight 900 µm buffer only, place a second fiber holder 300 mm (12 inches) from the end of the fiber. Latch the buffer clamp closed to ensure a stable cleave length.

3.5 Test the stripped fiber for weak points by using your finger to slowly flick the fiber in multiple directions. Watch for the fiber to spring back to the straight position. If the fiber breaks, properly dispose of the broken-off piece and re-strip the fiber.

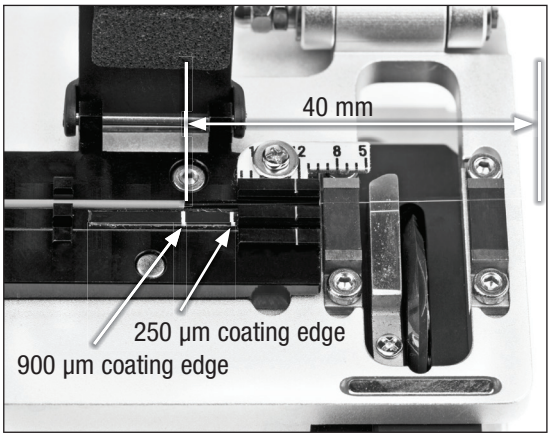


3.6 Thoroughly clean the stripped fiber with a lint-free wipe and alcohol or cleaning fluid. For 250 µm fiber at cold temperatures, use a new lint-free cloth for each stripped fiber. Otherwise the particles on the fiber can snag when inserting the fiber into the connector.

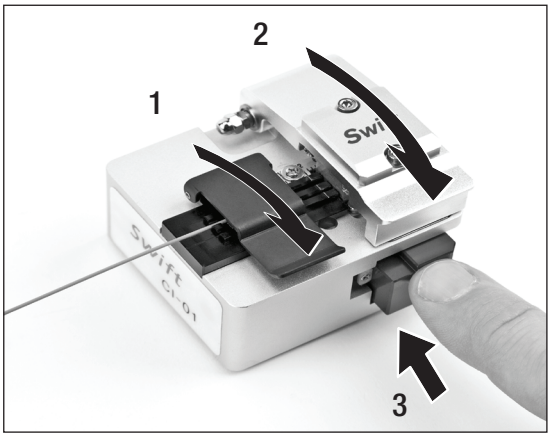
Note: Carefully follow safety, health and environmental information given on the product label or the Material Safety Data Sheet for the isopropyl alcohol or cleaning fluid.



3.7 Lay the 900 µm fiber into the larger of the 2 tracks on the cleaver. Cleave it to 24 mm, by aligning the coating edge with the left-most line on the fiber track. Lay the 250 µm fiber into the smaller track on the cleaver. Cleave it to 19 mm using the middle line. (If you are using another cleaver model or one from the 3M™ No Polish Connector Kit, then mark it at 24 mm and 19 mm.)

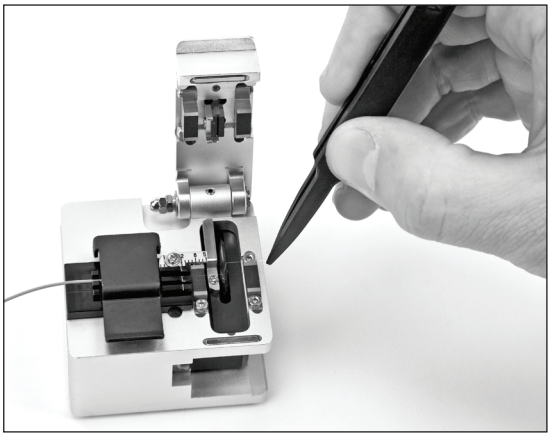


3.8 Close the left cover. Close the right cover. Push the shuttle forward to cleave the fiber.

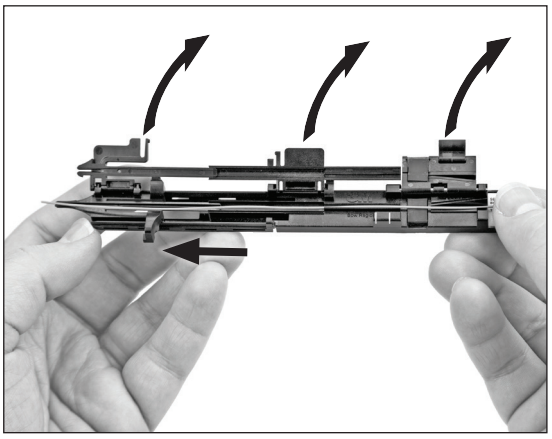


3.9 Open the right cover. Use tweezers to carefully grab the glass shard. Discard it in the shard container.

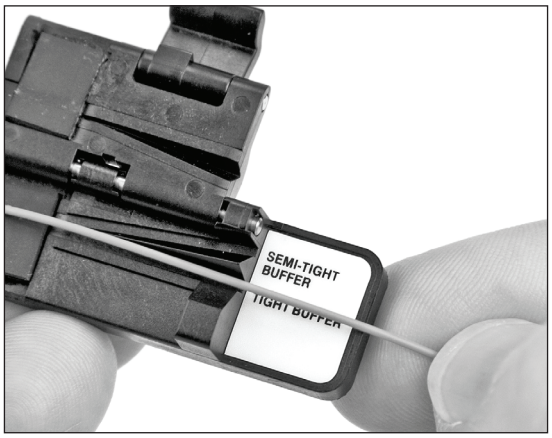
CAUTION: The glass shard is sharp and can pierce the skin.



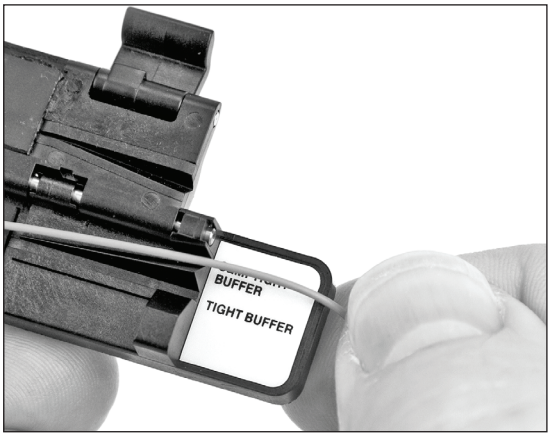
3.10 Open all 3 lids on the fiber holder. Slide the shuttle forward. Open the cleaver's left cover. Lay the fiber in the fiber holder.



3.11 Lay the fiber in the track running through the center of the fiber holder. Use the “TIGHT BUFFER” or “SEMI-TIGHT BUFFER” slits as appropriate. Reference section 3.3 to determine which fiber type.

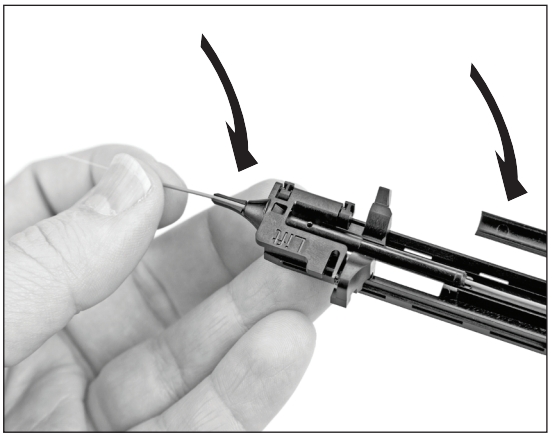


Tight buffer

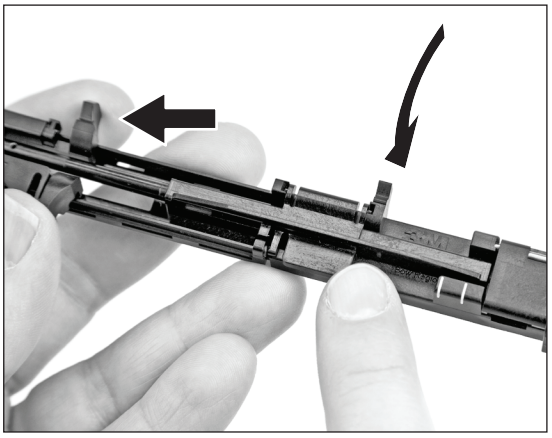


Semi-tight buffer

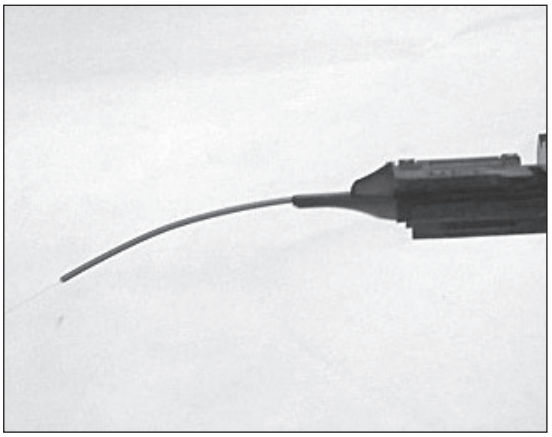
3.12 Move shuttle forward. Leave at least one finger width of buffer extending beyond the nozzle. Hold the buffer at both ends of the fiber holder, pull the fiber straight, and set the fiber in the center tracks. Close the back lid, but don't latch it. Close the front and middle lid.



3.13 Snap the front and middle lids shut. Push the shuttle forward again until it stops.

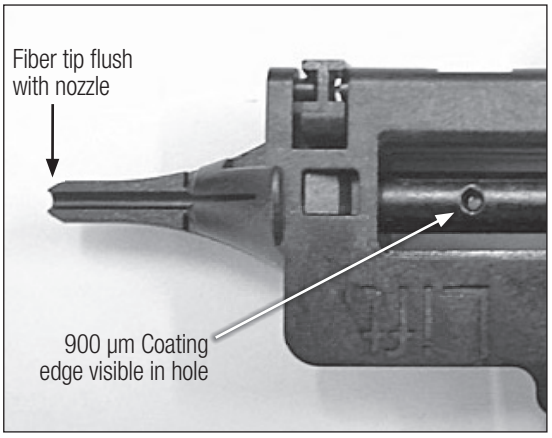


3.14 Rotate the fiber so the fiber curl is directed downward in the fiber holder.

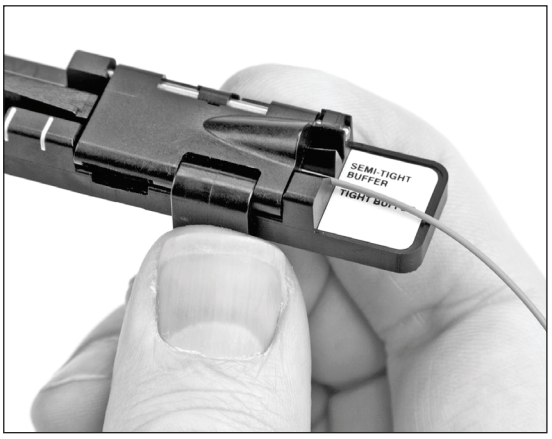


3.15 Hold fiber at rear, and pull the fiber backward. Position the fiber so the tip is flush (±1 mm) with the end of the nozzle.

Note: ***The 900 µm coating edge can be seen through a hole in the shuttle. Viewing this is a good method to check that the cleave length is correct (24 mm). For 250 µm, the edge cannot be seen through the hole, since it has a 19 mm cleave length.***

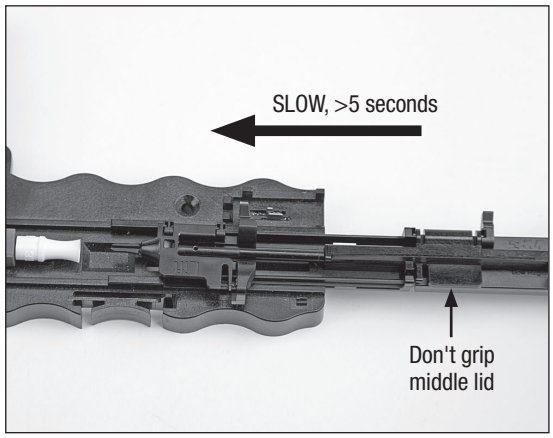


3.16 Close and latch the buffer clamp.



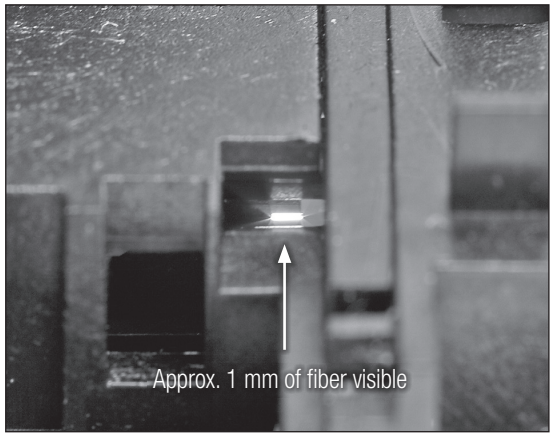
4.0 Fiber Insertion and Connector Activation

4.1 Grip the back of the fiber holder. Do not grip the front or middle lids, because they may need to pop open. Slowly insert the fiber holder (with cleaved fiber) into the guide track on the protrusion setting tool until it reaches a stop. Do not push or pull the back end of the fiber holder upward or downward while inserting it, because it can influence the front lid's reaction.



Note: Insert the fiber holder slowly to avoid breaking the fiber. This step should take 5 seconds or more. Faster insertion can lead to breaking the fiber. As the fiber holder slides in, the shuttle will reach a stop, and the cleaved end of the fiber will thread through the connector. Just prior to the fiber holder being fully inserted into the protrusion setting tool, 1 or 2 lids, depending on fiber stiffness, will pop open and the fiber will bow.

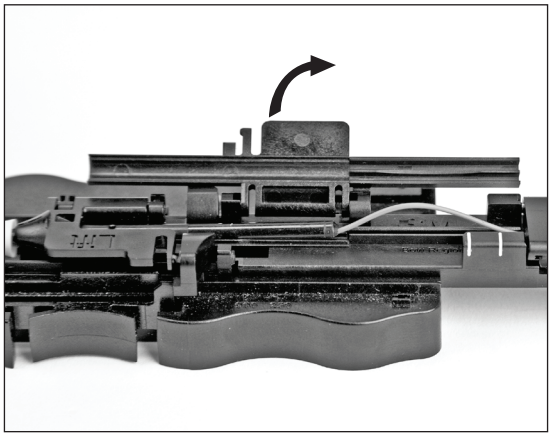
4.2 Verify that the cleaved end of the fiber extends beyond the tip of the connector ferrule. To do this, press and hold the push button on the flashlight contained within the protrusion setting tool and visually confirm the presence of approximately 1 mm of fiber through the viewing window.



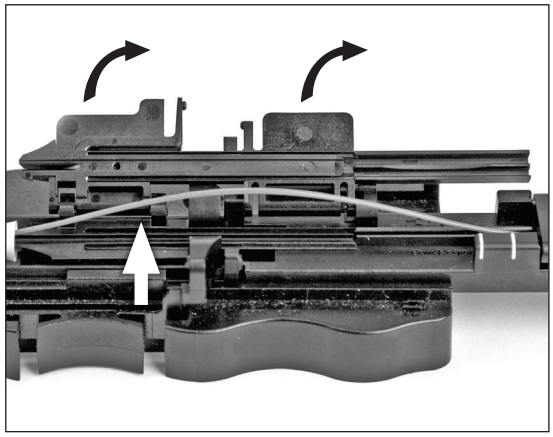
Note: If for some reason the fiber is not seen extending beyond the tip of the connector ferrule, withdraw the fiber holder (with cleaved fiber) from the protrusion setting tool and repeat as many of the preceding steps as necessary.

Note: There are many brands and types of 900 µm coated fiber. With 900 µm fiber, 1 or 2 lids on the fiber holder will pop open, depending on soft or stiff coating.

4.3 For soft-coated 900 µm fiber, only the middle lid will pop open. For stiff-coated 900 µm fiber, the fiber bow is strong enough to pop open both the front and middle lids. In hot weather or when using 900 µm break-out tube kits, the middle lid may not pop open. In that case, for 900 µm open the middle lid by hand before going to the next step. In cold weather some coatings will become more stiff.



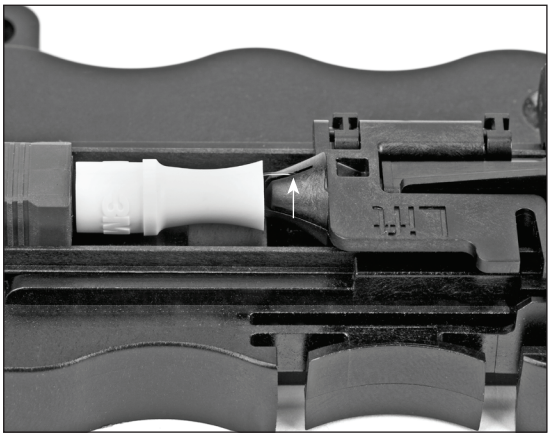
Soft 900 µm coating



Stiff 900 µm coating

4.4 For 250 µm only, the fiber will bow in the nozzle slot. No lids will open with 250 µm.

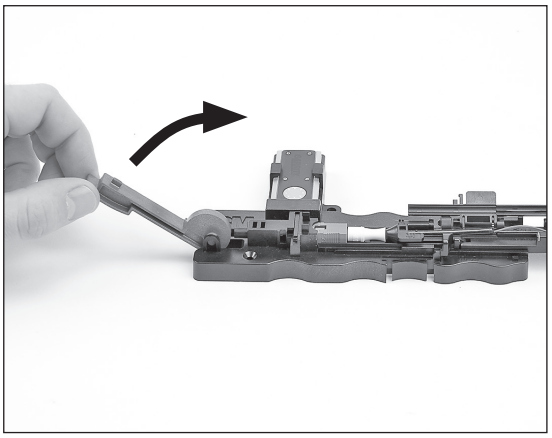
Note: Bowing these 3 different fiber coating types at 3 different lengths enables consistent fiber protrusion setting.



250 µm coating

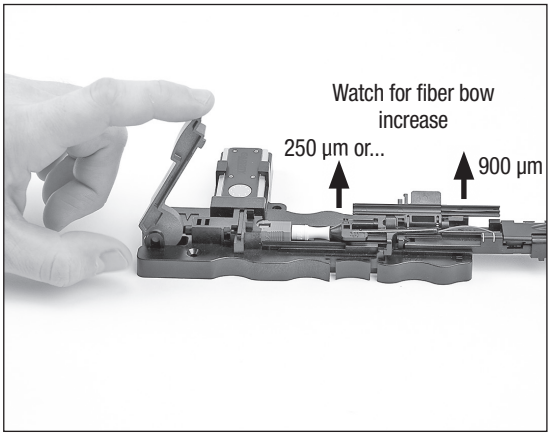
4.5 Rotate the activation lever on the protrusion setting tool 180° until the free end is positioned directly above the connector.

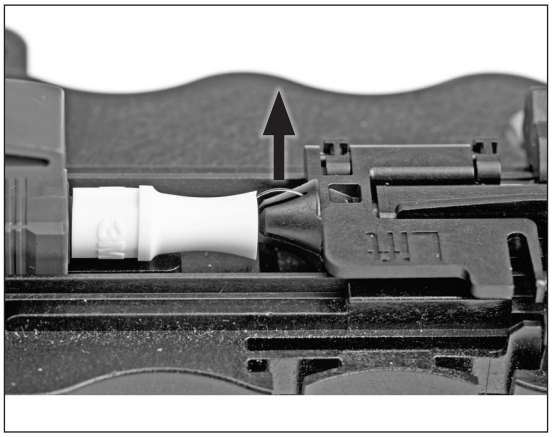
Note: Use caution to move the lever slowly to avoid damaging the fiber. Hold onto the lever, keeping it from springing forward on its own.

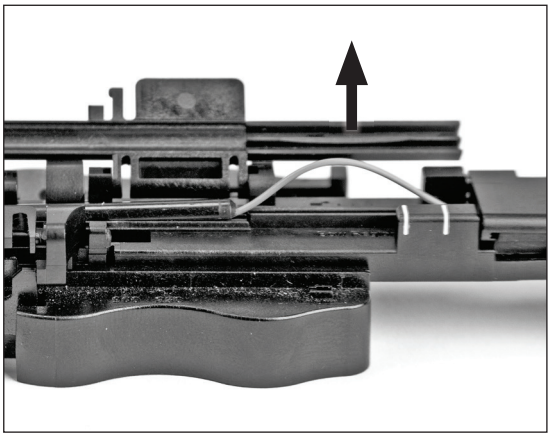


4.6 CRITICAL STEP: Watch for the fiber bow to increase slightly as the lever comes down. Do not proceed to the next step until seeing this. It is easiest to see the bow increase from a side view rather than a top view.

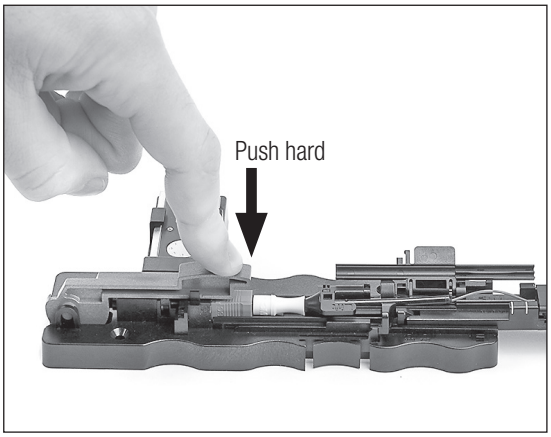
Note: The fiber bow increase is caused by the lever moving the jig tip which pushes the fiber backward.





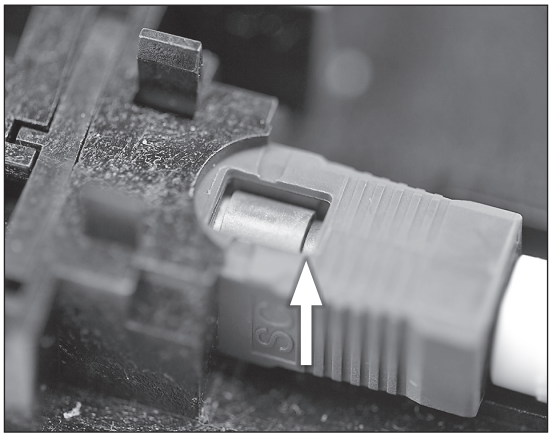


4.7 Press down hard on the free end of the activation lever to activate the fiber crimping mechanism within the connector. After a click sound, the lever will be stopped and cannot be pushed any further.

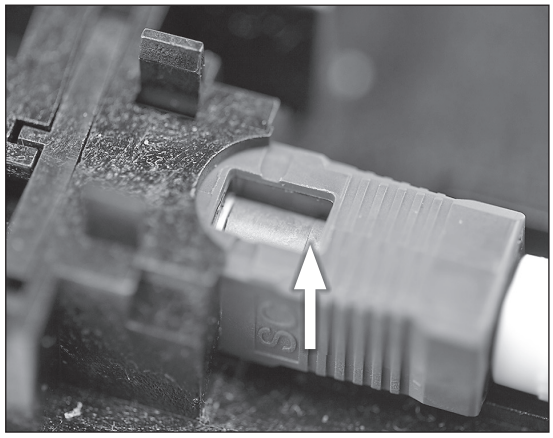


Note: Never activate a connector without a fiber in it or with a fiber only partially inserted. Doing so will ruin the connector by blocking fiber from being fully inserted.

Note: If you are not sure if the click was heard, and therefore not sure if the fiber is crimped, inspect the cap surface. A raised surface indicates the fiber IS NOT crimped. A flush, even surface indicates the fiber IS crimped.

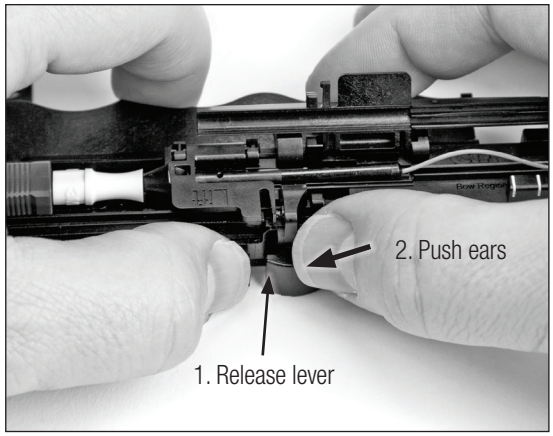


Not crimped



Crimped

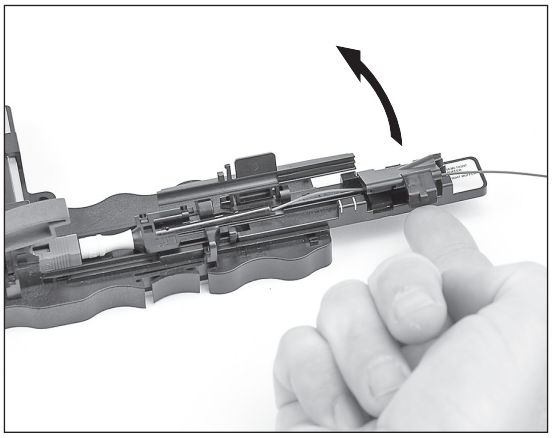
4.8 For 900 µm only. CRITICAL STEP: If you have the 3M™ 200X View Scope 6365-VS for end face inspection, skip this step (4.8) until after step 5.8, connector cleaning is complete. If you don't have the optional view scope accessory, activate the buffer strain relief within the connector using the shuttle on the fiber holder. While holding the entire tool in place, press the release lever on the side of the protrusion setting tool base and push on the two ears of the shuttle (toward the connector) until it reaches its travel limit.

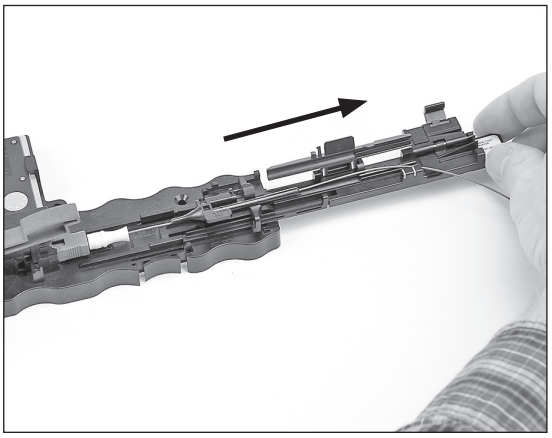


900 µm

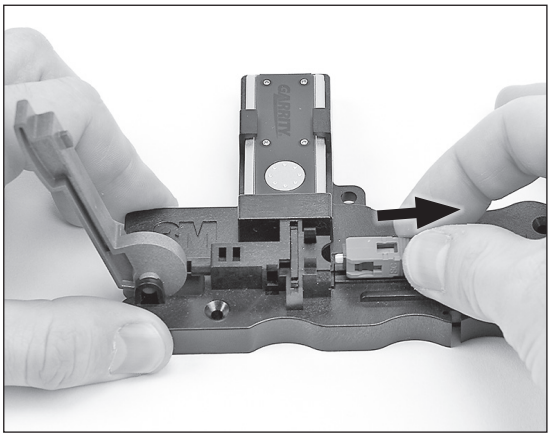
Note: This step increases the durability of the connection. If this step is skipped, then the connector is more likely to fall off the 900 µm fiber. There are no provisions to deactivate the 900 µm buffer strain relief within the connector. The grip strength will be relatively low for thin-wall, 900 µm break out tube kits, compared to standard 900 µm buffer.

4.9 Open the covers and buffer clamp (if necessary) on the fiber holder (for stiff-coated fiber, the buffer clamp was already opened). Slide the fiber holder out of the guide track in the protrusion setting tool, leaving the connector and fiber behind.





4.10 Remove the connector from the port on the protrusion setting tool. Use care to protect the ferrule and fiber tips from damage.



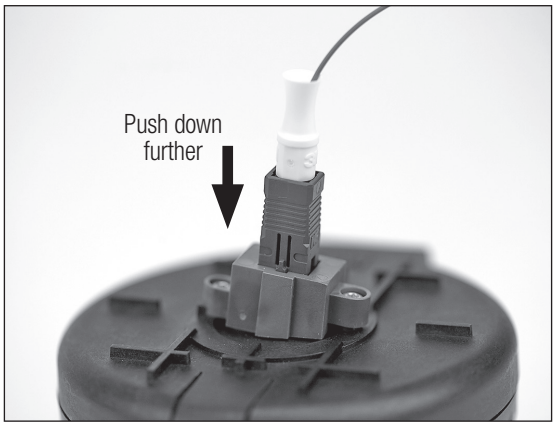
5.0 Nano-finishing and Cleaning

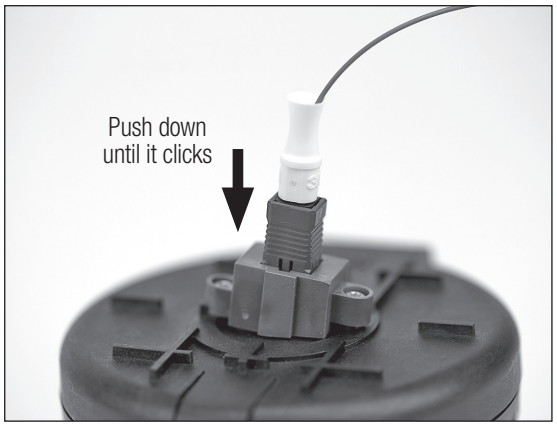
5.1 Complete the installation process using the 3M™ Nano-finisher. Open the lid on the finisher by first depressing the latch. For proper performance, only one finishing disc may be installed at a time. Use a new disc for each connector. Discs are provided in the connector package. Remove the adhesive-backed finishing disc from the protective liner, and place it onto the backup pad. Center the disc on the pad using the through hole and pin as visual references. Press the disc against the backup pad while taking care to keep it clean. Keep pressing the disc down until there are no air pockets under it. It is okay for your fingers to touch the polishing surface while pressing the disc down.

5.2 Wet the top surface of the finishing disc with 2 squirts of de-ionized water using the spray bottle provided. Avoid using excessive amounts of water. Close the lid fully and ensure the latch is engaged.

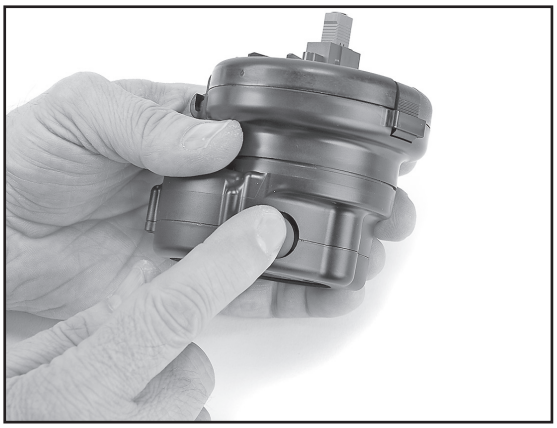
Note: Wetting the disc surface is important because it carries off glass particles that have been removed. Failure to wet the disc results in poor connector performance.

5.3 Insert the connector into the port on the 3M™ Nano-finisher lid making certain it is fully engaged. Push until a click is heard.





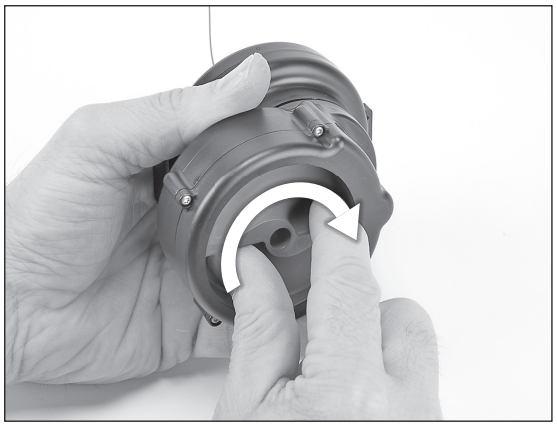
5.4 Press the release button on the side of the finisher. The button will stay depressed until the finishing sequence is complete. It pops back up automatically. Allow this to happen by keeping clear of the button during the sequence.



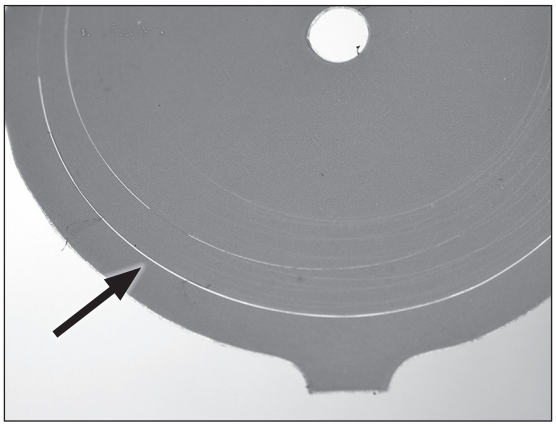
5.5 Rotate the input knob one full turn with a single continuous motion. The finisher automatically stops the input knob after one full turn.

5.6 Remove the connector from the port on the finisher lid.

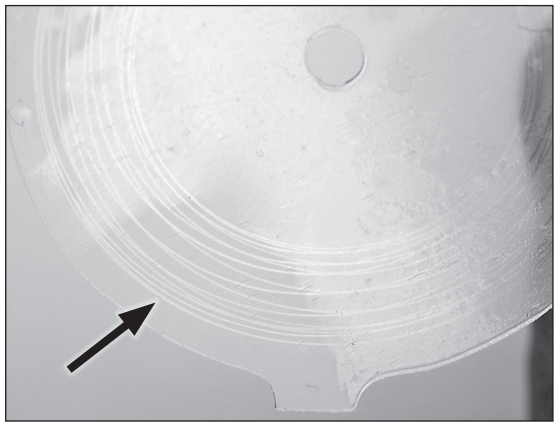
Note: The nano-finisher is best stored dry – inside and out. Open the lid as shown in step 5.1, and allow to dry.



5.7 Remove the lapping film. Inspect the lapping film for fiber tracks. If the film has tracks, dispose of it. If not, restart at step 5.1.

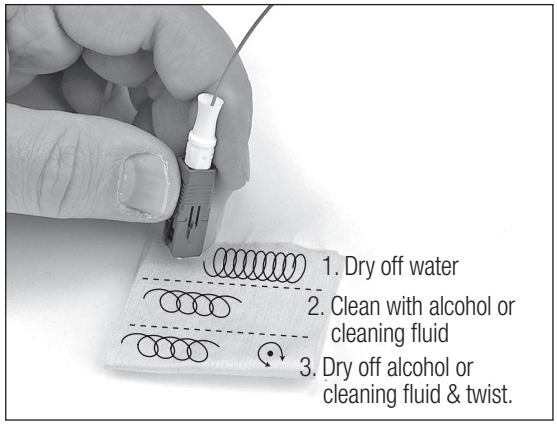


APC



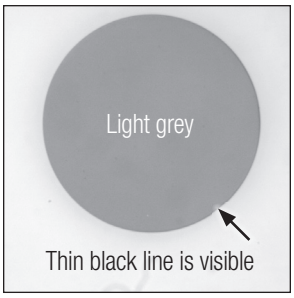
UPC

5.8 Dry the connector using a new lint-free wipe. Do not use the same wipe used for stripping fiber. Fold the wipe to provide cushion. For APC, tilt the connector so the ferrule tip is in full contact with the wipe. For UPC, hold the connector perpendicular to the wipe. Press the ferrule tip into the wipe slightly and move the tip in a circular motion. After the connector has been dried, add 1 or 2 drops of alcohol or cleaning fluid to a clean area of the wipe. Do not mix water and alcohol or water and cleaning fluid on the wipe. If too much alcohol or cleaning fluid soaks the wipe, just use the edge of the wetted area. Clean the connector by moving the tip in a small circular motion. Then dry the connector with a spot on the wipe that has not been used yet, and is not contaminated with water, alcohol or cleaning fluid. Use a small circular motion. Finish with a twisting motion.



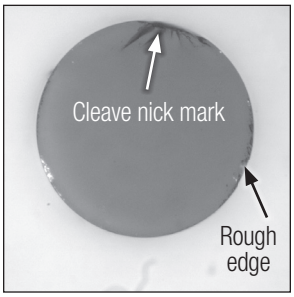
5.9 Before the network has a laser light source feeding your connector, inspect the fiber end face with 3M™ 200X View Scope 6365-VS if you have one. If the fiber end face looks acceptable per photos to the right, then re-insert the connector into the protrusion setter and activate the buffer clamp per step 4.8. If the connector needs rework, proceed to Section 6.0.

Caution reminder: Never look directly into the end of a fiber or connector when connected to a laser light source using the naked eye or a microscope.



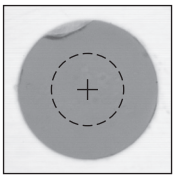
Ideal clean fiber end face

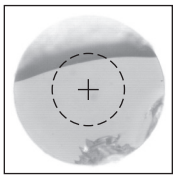
Fiber is missing, go to step 6.1



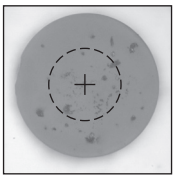
Not polished, restart at step 5.1

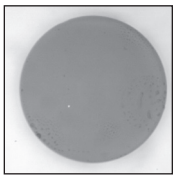
Chips or cracks inside the 1/2 diameter circle are not allowed.

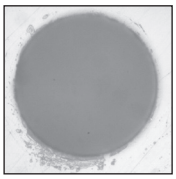

Acceptable chip

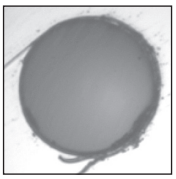

Unacceptable chip, needs rework

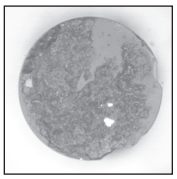
Unacceptable crack, needs rework

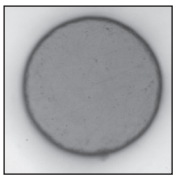

Dirty, clean full diameter


Alcohol on fiber, re-dry


Alcohol on ferrule, re-dry


Thread caught, re-clean with a twist


UPC only photo: forgot to spray water, needs rework

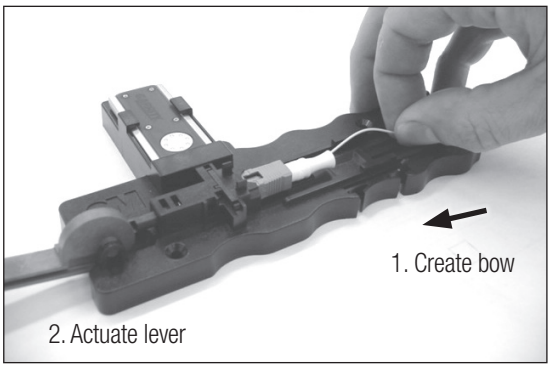

Forgot to use lapping film, needs rework

6.0 Connector Reusability

6.1 Should it become necessary to separate the connector and fiber, e.g. to reset the fiber protrusion, the activation cap within the connector can be deactivated. This is accomplished by first removing the connector from the port on the protrusion setting tool. Place the connector atop the deactivation station on the tool base, with the activation cap face up, and press firmly downward. This action releases the gripping mechanism within the connector. Limit the number of times a given connector is reused to one. A connector with its cap pushed down without a fiber inside, or with a fiber only partially inserted, is not reusable.

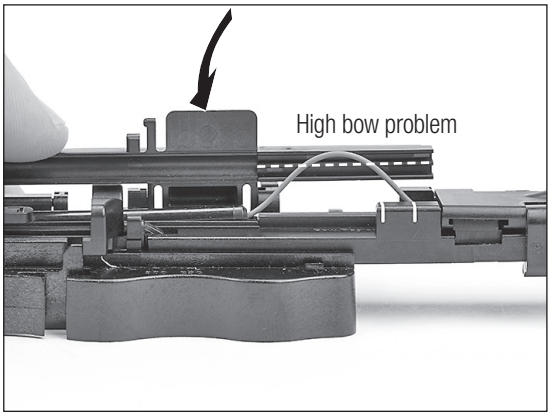
6.2 To correct large, deep imperfections on the fiber face, restart at step 2.0. Replace the lapping film disc for each re-use of the connector.

6.3 To correct small, shallow imperfections, such as small chips, reinsert the connector in the protrusion setter. Hold the fiber with your fingers and create a bow in the fiber. The bow length should be approximately as shown in Step 4.3 for 900 µm, and approximately as shown in Step 4.4 for 250 µm. Hold the fiber bow and begin completing Steps 4.5 through 5.8. Use a new piece of lapping film per Step 5.1.

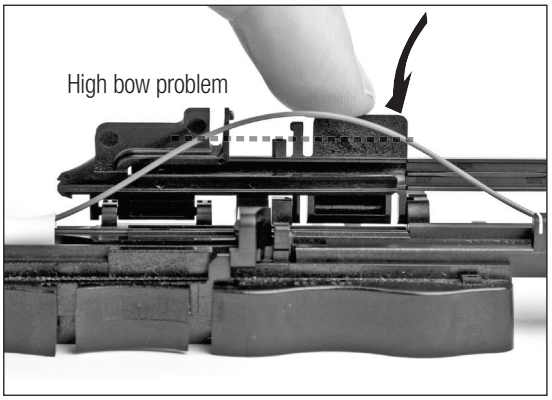


7.0 Troubleshooting

7.1 If the fiber is not visible with the flashlight in step 4.2, and bow increase is not seen in step 4.6, check the bow height by tilting the middle door on the fiber holder to the vertical position, as shown in the photo to the right. If the fiber bow is taller than the rib in the center of the middle door, marked with a dotted line illustrated on the right, then the fiber bow is too high. The fiber has hit a snag inside the connector. Remove the fiber and fiber holder from the protrusion setter. Open the latch on the fiber holder's buffer clamp. Re-adjust the fiber so that fiber curl is downward as shown in step 3.12. Attempt inserting the fiber into the connector again per section 4.0. If a high bow occurs again, re-strip the fiber and re-cleave per section 3.0. If the same high bow problem occurs again, mark the connector as defective and get a new connector.



Soft 900 µm coating



Stiff 900 µm coating

7.2 If the a connector falls off 250 µm fiber, install a new connector, and ensure that the 250 µm acrylate has been stripped off 40 mm long, per step 3.2. Also ensure cleave length is 19 mm per step 3.7. Also ensure that the termination matches photos 4.2, 4.4, and 4.6.

7.3 For APC only, if insertion loss is 2.9 dB - 3.6 dB, then inspect the lapping film per section 5.7. Polish the connector if it has not been polished yet.

3M™ Crimplok™+ Connector, Kit and Tool Descriptions

Product Number	Description	Packaging
8700-PS/APC	3M Crimplok+ Connector SM SC/APC, 250/900 µm (green housing) with protrusion setting tool	60/package
8700-APC	3M Crimplok+ Connector SM SC/APC, 250/900 µm (green housing) without tool	12/package
8700-PS/UPC	3M Crimplok+ Connector SM SC/UPC, 250/900 µm (blue housing) with protrusion setting tool	60/package
8700-UPC	3M Crimplok+ Connector SM SC/UPC, 250/900 µm (blue housing) without tool	12/package
6700-50	3M Crimplok+ Connector SC 50 µm MM 250/900 µm	12/package
6700-PS/50	3M Crimplok+ Connector SC MM 50 µm 250/900 µm w/Tool	60/package
6700-50/LOMMF	3M Crimplok+ Connector SC 50 µm LOMMF 250/900 µm	12/package
6700-PS/50/LOMMF	3M Crimplok+ Connector SC LOMMF 50 µm 250/900 µm w/Tool	60/package
6700-62.5	3M Crimplok+ Connector SC 62.5 µm MM 250/900 µm	12/package
6700-PS/62.5	3M Crimplok+ Connector SC MM 62.5 µm 250/900 µm w/Tool	60/package
8765-APC	3M Crimplok+ Termination SC/APC Kit	1/package
8765-UPC	3M Crimplok+ Termination SC/UPC Kit	1/package
2534	Fiber Optic Cleaver	1/package
-	Label for 19 mm and 24 mm cleave lengths (to retrofit 2534, No Polish Connector cleavers) Available by contacting 3M Technical Service	1/package
8765-PS/APC	3M Crimplok+ APC Protrusion Setting Tool and Fiber Holder	1/package
8765-PS/UPC	3M Crimplok+ UPC Protrusion Setting Tool and Fiber Holder	1/package
8765-NF/APC	3M Crimplok+ APC Nano Finishing Tool	1/package
8765-NF/UPC	3M Crimplok+ UPC Nano Finishing Tool	1/package
6365-TH	Fiber Optic Stripper	1/package
6365-KS	Fiber and Aramid Yarn Scissors	1/package
-	3M Lapping Film, available with every connector	1/connector
8765-LFW	Lint-free Cloths	1/package
8765-CS	Cleaning Swabs	100/package
-	Water Spray Bottle, empty; only available with a kit purchase	1/package
VOL-0560R	Optional: Alcohol Bottle, empty	1/package
6365-VS	Optional: 3M 200X View Scope CAUTION: DO NOT USE when connectors are illuminated with a laser source.	1/package
11356-00000-10	Optional: 3M™ Light Vision™ Safety Glasses with LED lights	1/package

3M, Lightvision and Crimplok are trademarks of 3M Company.

Important Notice

All statements, technical information, and recommendations related to 3M's products are based on information believed to be reliable, but the accuracy or completeness is not guaranteed. Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use. Any statements related to the product which are not contained in 3M's current publications, or any contrary statements contained on your purchase order shall have no force or effect unless expressly agreed upon, in writing, by an authorized officer of 3M.

Warranty; Limited Remedy; Limited Liability.

This product will be free from defects in material and manufacture for a period of one (1) year from the time of purchase. **3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** If this product is defective within the warranty period stated above, your exclusive remedy shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product. **Except where prohibited by law, 3M will not be liable for any indirect, special, incidental or consequential loss or damage arising from this 3M product, regardless of the legal theory asserted.**

3M

Communication Markets Division
6801 River Place Blvd.
Austin, TX 78726-9000
1-800-426-8688
www.3M.com/Telecom

Please Recycle. Printed in USA.
© 3M 2013. All Rights Reserved.
78-0013-1746-6-E